## Space Weather Forecast

Issued on Friday 10 January 2025 at 13:06 Local

**This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of isolated Moderate class flares.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Low solar activity during the last 24 hours with only Common-class flares, the largest peaking at 10/0942 UTC from a region in the southwest. There are eleven sunspot regions visible on the Earth-facing disc. The only region currently of note is in the northwest, which has been responsible for the majority of any recent flare activity. A newly formed region in the northeast has shown some rapid growth. The remaining regions on the disc remain small and simple at present.

Due to a lack of recent SOHO coronagraph imagery combined with large gaps in STEREO coronagraph imagery the detection of Coronal Mass Ejections (CMEs) is more uncertain than usual. A possible filament eruption near the centre disc on 09 Jan may bring some enhancement at Earth, however this can not be correlated with coronagraph imagery at present.

**Solar Wind / Geomagnetic Activity:** Solar winds were initially at background levels, becoming slightly elevated by a weak fast wind onset from 10/0100 UTC. The Interplanetary Magnetic Field (IMF) was weak to moderate. The north-south component, was variable and generally weak, but with a brief moderate negative interval around 09/1432 UTC. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) was at background levels.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Low to Moderate with an ongoing chance of isolated Moderate-class flares.

**Solar Wind / Geomagnetic Activity:** A lack of coronagraph imagery means that CME analysis is difficult and comes with increased uncertainty. A possible filament eruption from near the centre disc on 09 Jan may bring some enhanced geomagnetic activity, most likely over the UTC weekend. Solar winds are showing are currently slightly elevated, perhaps due to the onset of a weak coronal hole fast wind which is expected through Days 1-2 (10-11 Jan).

Geomagnetic activity is expected to be mostly Quiet to Unsettled, perhaps with the odd Active interval Days 1-2 (10-11 Jan) with any high speed stream influence. Any CME influence is likely to

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be rather dense, with a chance of G1 to G2 Minor/Moderate storms intervals on Days 2-3 (11-12 Jan), but this is very low confidence.

**Energetic Particles / Solar Radiation:** Solar radiation is expected to remain near background levels, with only a slight chance of rising in response to any notable flares.

## Geomagnetic Storms

| Geomagnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| **Minor or Moderate** | **G1 to G2** | No | 5 | 20 | 25 | 15 |
| **Strong** | **G3** | No | 1 | 5 | 10 | 5 |
| **Severe** | **G4** | No | 1 | 1 | 1 | 1 |
| **Extreme** | **G5** | No | 1 | 1 | 1 | 1 |

## Radio Blackouts - X-Ray Flares

| X-Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| **Active** | **R1-R2 (M Class)** | No | 50 | 50 | 50 | 50 |
| **Very Active** | **R3-R5 (X Class)** | No | 10 | 10 | 10 | 10 |

## Solar Radiation Storms (High Energy Protons)

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}sr^{-1}s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| **Active** | **≥ S1** | No | 10 | 15 | 15 | 15 |
| **Very Active** | **≥ S3 *** | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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